SPR 51-1

FOREST INSECT AND DISEASE CONDITIONS

1986

Pacific Northwest Region

The spruce budworm and mountain pine beetle continued to account for most of the insect-infested acreage reported in the Pacific Nothewest Region.

The western spruce budworm-defoliated acerage covered about 6 million acres. This acreage includes the

Mountain pine beetle-caused tree killing increased with about 1.7 million acres infested. The majority of the loss, 1.4 million acres, occurred in the lodgepole stands in south-central Oregon.

Root diseases are among the most serious pests in Pacific Northwest forests because of the magnitude of losses and difficulty of treatment. Annual timber volume losses due to root diseases are estimated at 130 million cubic fwwt in Oregon and Washington.

Dwarf mistletoes continue to cause large timber losses, although they are steadily declining. Annual losses are estimated at 133 million cubic feet.

Good progress is being made to hazard rate sites for white pine blister rust infection and damage potential.

Paific Northwest Region--Status of insects in Oregon and Washington

David R. Bridgwater

Insect	Host	Location	Remarks
Douglas-fir beetle *Dendroctonus pseudotsugae*	Douglas-fir	Oregon, Washington	Douglas-fir beetle damage decreased east of the Cascade Range: losses in Douglas-fir occurred on 3,700 acres (245,730 cubic feet). Current damage levels are still far below what they were in the 1970's. The greatest damage in 1986 was on the Wallowa-Whitman National Forest in Oregon. West of the Cascades, losses decreased significantly. Damage was reported on 3,670 acres in 1986 compared with 17,720 acres in 1985, volume loss fell from 1.2 million cubic feet in 1985 to 0.8 million cubic feet in 1986.
Douglas-fir bud moth *Zeiraphera hesperiana*	Douglas-fir	Oregon	Light to heavy defoliation was reported on 122,650 acres of mature Dougas-fir. Most of the defoliation was on the Siuslaw National Forest and adjoining State, private, and Bureau of Land Management lands. Smaller areas of defoliation occurred on the Willamette National Forest. This is the second year defoliation caused by this insect since the mid-1960's.
Fir engraver *Scolytus ventralis*	True firs	Oregon, Washington	A substantial increase in fir engraver activity was noted in Washington and remained the same in Oregon. Most of the fir engraver damage occurred on sites infected with either laminated root rot, armillaria root disease, or annosus root disease, diseases which weaken true firs, making them susceptible to beetle attacks. Total losses occurred on 15,920 acres (315,200 cubic feet) as compared to 11,470 acres (198,020 cubic feet) in 1985.

Pacific Northwest Region--Status of insects in Oregon and Washington--Continued

Insect	Host	Location	Remarks
Gypsy moth *Lymantria dispar*	Conifers, various hardwoods	Oregon, Washington	Adult trap catches decreased in Washington from 175 in 1985 to 56 in 1986. An eradication project was continued in Bellingham, WA, and a new one began in Manor, WA, using the inherited sterility technique. In Oregon, adult trap catches were 1,537 in 1985 but 246 in 1986. An eradication project using *B.t.* was conducted in Lane County on 194,000 acres. A 12,000-acre eradication project is proposed for 1987.
Modoc budworm *Choristoneura retiniana*	Douglas-fir, true firs	Southern Oregon	Modoc budworm defoliation decreased in southern Oregon in true fir stands on the Fremont and Winema National Forests. Acres of visible defoliation decreased from 503,400 in 1985 to 281,910 in 1986.
Mountain pine beetle *Dendroctonus ponderosae*	Lodgepole pine, ponderosa pine, western white pine, other pines	Oregon, Washington	In Washington, losses increased. In Oregon, losses have intensified on the Deschutes, Fremont, and Winema National Forests in Oregon. Losses continue to decline on the Wallowa-Whitman, Malheur, and Umatilla National Forests, primarily because the most suitable host trees have already been killed. The 1986 beetle losses occurred on 1.4 million acres (61.7 million cubic feet) of lodgepole pine; 288,000 acres (6.0 million cubic feet) of ponderosa pine; 49,030 acres (2.9 million cubic feet) of western white pine; and about 1,630 acres of various other pines. Intense losses are expected to continue in south-central Oregon and north-central Washington and to decrease elsewhere.
Pine engraver *Ips* sp.	Ponderosa pine	Oregon, Washington	Pine engraver activity increased to 10,040 acres. Most of the activity was on the Deschutes and Ochoco National Forest in Oregon, and the Wenatchee and Okanogan National Forest in Washington.

Insect	Host	Location	Remarks
Spruce beetle *Dendroctonus rufipennis*	Engelmann spruce	Oregon, Washington	Spruce beetle activity in Engelmann spruce stands in Oregon increased significantly, however, losses in Washington were very low this year. Losses occurred on 24,500 acres (1.8 million cubic feet). A major outbreak is on the Wallowa-Whitman National Forest near Halfway, OR.
Sugar pine tortrix *Choristoneura lambertiana*	lodgepole pine, ponderosa pine	Oregon	Defoliation was first discovered in many years in 1985 from the ground. This year was the defloiation was visible from the air over 136,560 acres. The defoliation occurred on the Deschutes, Fremont, and Winema National Forests.
Western pine beetle *Dendroctonus brevicomis*	Ponderosa pine	Oregon, Washington	Tree mortality caused by the western pine beetle decreased in Oregon and Washington from 4.9 million cubic feet in 1985 to 2.6 million cubic feet in 1986. Greatest losses occurred on the Winema and Deschutes National Forests.
Western spruce budworm *Choristoneura occidentalis*	Douglas-fir Engelmann spruce, true firs, western larch	Oregon, Washington	In the Pacific Northwest Region, visible defoliation caused by the western spruce budworm increased from 5.0 million acres in 1985 to 6.0 million acres in 1986. In Oregon, budworm continued to increase on the Wallowa-Whitman, Mt. Hood, Deschutes, and Umatilla National Forests; on the Warm Springs Indian Reservation; and on intermingled State and private lands. In Washington, the size of the budworm infestation on the Okanogan National Forest and adjacent State and private lands increased in 1986, and decreased on the Wenatchee National Forest.

OTHER INSECTS OF INTEREST

The calafornia tortiseshell butterfly heavily defoliated patched of ceanothus on the east side of the Cascade range. Defoliation should continue in 1987.

Grasshoppers continued to cause damage to range land in eastern Oregon and Washington. APHIS conducted a suppression project on about 800,000 acres in both states.

Pacific Northwest Region--Status of diseases in Oregon and Washington

Donald J. Goheen

Disease	Host	Location	Remarks
STEM AND BRANCH DISEASES			
Dwarf mistletoes *Arceuthobium* spp.	Various conifers	Oregon, Washington	As stand management intensifies, losses due to this group of disease-causing organisms are declining. However, dwarf mistletoes still caused an estimated loss of 132 million cubic feet of timber in Oregon and Washington in 1986. Programs for handheld programmable calculators are being used to project reductions in yield and perform economic analyses for dwarf mistletoe-infected lodgepole pine in central Oregon.
Stem decay	Various conifers	Oregon, Washington	Stem decay fungi still consume enormous volumes of wood. Most losses occur in younger stands of thin-banked species as wounding of residual trees during stand entries both activates dormant infections and creates excellent infection courts. Programs for handheld calculators have been developed to estimate percentages of infection and decay in white and grand fir understories, two of the most defective species in the Region.
White pine blister rust *Cronartium ribicola*	Sugar pine, western white pine	Oregon, Washington	Annual losses of western white and sugar pines from blister rust in Oregon and Washington are estimated to be 15 million cubic feet. Additional training and followup on use of handheld programmable calculator programs for predicting infection hazard occurred during 1986.
ROOT DISEASES	Various conifers	Oregon, Washington	Root diseases are among the most serious pest problems in Oregon and Washington forests. The incidence of root disease is increasing, often in direct response to human activity. Annual losses to root diseases on all ownerships are estimated at over 130 million cubic feet.

Pacific Northwest Region--Status of diseases in Oregon and Washington--Continued

Disease	Host	Location	Remarks
Annosus root disease *Heterobasidion annosum*	Western hemlock, white fir	Oregon, Washington	Annosus root disease is responsible for extensive losses in many partial-cut white fir stands in southern and eastern Oregon. Most loss is due to outright tree mortality. Evidence points to extensive infection throughout eastern Oregon and Washington. Losses in western hemlock stands can be minimized by short (100-year) rotations and wound prevention.
Armillaria root disease *Armillaria* spp.	Various conifers	Oregon, Washington	The most serious losses to this disease occur east of the Cascades. Losses west of the Cascades are usually confined to stressed stands, for example, off-site plantings. Direct control through stump and root removal is being practiced in severely infected stands in eastern Washington.
Black stain root disease *Ceratocystis wageneri* [*Verticicladiella wageneri*]	Douglas-fir	Oregon, Washington	In southwestern Oregon, this is by far the most commonly encountered disease in Douglas-fir plantations. It appears to be especially damaging where disturbances have occurred, especially in roadside Douglas-firs cut back by mechanical choppers. Losses are also greater on tractor-logged sites, which have greater soil compaction, than on cable-logged sites.
Laminated root rot *Phellinus weirii*	Douglas-fir, grand fir, white fir	Oregon, Washington	Laminated root rot is estimated to have removed about 5 percent of the Douglas-fir type west of the Cascades from full production. The total acreage infested may be closer to 10 percent of the Douglas-fir. Damage is also severe in some East Side grand and white fir stands.
Port-Orford-cedar root disease *Phytophthora lateralis*	Port-Orford-cedar	Southwestern Oregon	Port-Orford-cedar root disease continues to cause widespread mortality of Port-Orford-cedar in southwestern Oregon.

Pacific Northwest Region--Status of diseases in Oregon and Washington--Continued

Disease	Host	Location	Remarks
FOLIAGE DISEASES			
Dothistroma needle blight *Mycosphaerella pini* [*Dothistroma septospora* (=*Dothistroma pini*)]	Douglas-fir, lodgepole pine, ponderosa pine	Oregon, Washington	The incidence of several foliage diseases was low relative to some past years because of dry weather conditions in spring and early summer.
Douglas-fir needle cast *Rhabdocline pseudotsugae*			
Elytroderma disease *Elytroderma deformans*			
NURSERY DISEASES			
Douglas-fir canker diseases *Phoma eupyrena* *Fusarium roseum* *Botrytis cinerea* *Phomopsis* spp.	Douglas-fir	Oregon, Washington	Damage is scattered, with less than 1 percent of crop affected in most nurseries. Fungicide applications are helpful when cankers are above ground and not covered with soil collars.
Fusarium root and hypocotyl rots *Fusarium oxysporum*	Various conifers	Oregon, Washington	Scattered losses for most species; continued heavy mortality in sugar pine.
Larch needle cast *Meria laricis*	Western larch	Washington	Dry weather and fungicide treatments resulted in little infection or defoliation during 1986.
Phytophthora root rot *Phytophthora* spp.	Douglas-fir, other conifers	Oregon, Washington	Damage is confined primarily to low, poorly drained areas of nursery beds.